IN THE CLAIMS:

The following is a complete listing of the claims and replaces all earlier listings and all earlier versions.

1. (Currently Amended) An image processing apparatus comprising:

characteristic discrimination means for discriminating characteristics of an image;

saturation calculation means for calculating saturation information of the image;

parameter setting means for setting a parameter used to convert saturation of the image in accordance with the characteristics discriminated by said characteristic discrimination means; and

saturation conversion means for converting the saturation of the image on the basis of the parameter; and

holding means for holding saturation information in correspondence with the plurality of attributes,

wherein said parameter setting means sets the parameter on the basis of the saturation information held in said holding means.

2. (Presented Previously) The apparatus according to claim 1, wherein said characteristic discrimination means discriminates one of a plurality of attributes to which the image belongs.

3. (Presented Previously) The apparatus according to claim 2, wherein the attribute is a color attribute of an image.

4. (Presented Previously) The apparatus according to claim 2, wherein the attribute is set in correspondence with an object in an image.

5. (Presented Previously) The apparatus according to claim 4, wherein the attribute includes at least one of attributes "person", "flower", "sky", "grass", "ground", and "general background".

6. (Presented Previously) The apparatus according to claim 5, wherein the attribute further includes an attribute "white" indicating that a content of an image is substantially white.

7. (Presented Previously) The apparatus according to claim 6, wherein the attribute further includes an attribute "other" which does not belong to any other attributes.

8. (Canceled)

9. (Presented Previously) The apparatus according to claim 8, wherein said holding means holds optimal saturation values in units of attributes.

10. (Presented Previously) The apparatus according to claim 9, wherein said parameter setting means sets the parameter to convert saturation of a color indicated by the attribute in the image into a saturation value held in said holding means.

11. (Presented Previously) The apparatus according to claim 2, wherein said characteristic discrimination means segments the image into a plurality of blocks, and discriminates attributes in units of blocks.

12. (Presented Previously) The apparatus according to claim 11, wherein said parameter setting means sets the parameter on the basis of an attribute with high priority when attributes differ in units of blocks.

13. (Presented Previously) The apparatus according to claim 1, wherein said parameter setting means sets a plurality of parameters.

14. (Currently Amended) ~~The~~ An image processing apparatus comprising:

characteristic discrimination means for discriminating characteristics of an image;

saturation calculation means for calculating saturation information of the image;

parameter setting means for setting a parameter used to convert

saturation of the image in accordance with the characteristics discriminated by said

characteristic discrimination means; and

saturation conversion means for converting the saturation of the

image on the basis of the parameter ~~according to claim 13~~,

wherein said parameter setting means sets ~~the~~ a plurality of

parameters in correspondence with low- and high-saturation sides of the image.

16. (Presented Previously) The apparatus according to claim 13,

wherein said saturation conversion means determines saturation conversion characteristics

on the basis of the plurality of parameters, and converts saturation of the image on the basis

of the saturation conversion characteristics.

16. (Presented Previously) The apparatus according to claim 15,

wherein said saturation conversion means determines the saturation conversion

characteristics on high- and low-saturation sides of the image on the basis of the plurality

of parameters.

17. (Presented Previously) The apparatus according to claim 16,

wherein the saturation conversion characteristics exhibit a monotonous increase.

18.   (Presented Previously) The apparatus according to claim 16, wherein the saturation conversion characteristics exhibit a monotonous decrease.

19.   (Presented Previously) The apparatus according to claim 1, wherein said saturation calculation means calculates saturation information of the image by converting the image expressed in a first color space into a second color space.

20.   (Presented Previously) The apparatus according to claim 19, wherein said saturation calculation means further converts the image, which has been saturation-converted in the second color space by said saturation conversion means, into the first color space.

21.   (Presented Previously) The apparatus according to claim 19, wherein the first color space is an RGB color space, and the second color space is an HLS color space.

22.   (Currently Amended) ~~The~~ An image processing apparatus, ~~according to claim 1, further~~ comprising:

        characteristic discrimination means for discriminating characteristics of an image;

        saturation calculation means for calculating saturation information of the image;

parameter setting means for setting a parameter used to convert saturation of the image in accordance with the characteristics discriminated by said characteristic discrimination means;

saturation conversion means for converting the saturation of the image on the basis of the parameter;

detection means for detecting a color distribution of the image;

generation means for generating gradation correction information of the image on the basis of the color distribution; and

gradation correction means for performing gradation correction of the image on the basis of the gradation correction information.

23.   (Presented Previously) The apparatus according to claim 22, wherein said saturation conversion means performs saturation conversion for an image which has undergone the gradation correction by said gradation correction means.

24.   (Presented Previously) The apparatus according to claim 22, wherein said generation means comprises:

highlight calculation means for calculating highlight area information of an image on the basis of the color distribution; and

white balance calculation means for calculating white balance information on the basis of the highlight area information and a predetermined highlight value, and

said gradation correction means corrects gradation of the image on the basis of the white balance information and the highlight value.

25.   (Presented Previously) The apparatus according to claim 22, wherein said generation means comprises:

shadow calculation means for calculating shadow area information of an image; and

black balance calculation means for calculating black balance information on the basis of the shadow area information and a predetermined shadow value, and

said gradation correction means corrects gradation of the image on the basis of the black balance information and the shadow value.

26.   (Currently Amended) An image processing method comprising:

the characteristic discrimination step of discriminating characteristics of an image;

the saturation calculation step of calculating saturation information of the image;

the parameter setting step of setting a parameter used to convert saturation of the image in accordance with the characteristics discriminated in the characteristic discrimination step; and

the saturation conversion step of converting the saturation of the image on the basis of the parameter; and

a holding step for holding saturation information in correspondence with the plurality of attributes,

wherein said parameter setting step includes setting the parameter on the basis of the saturation information held in said holding step.

27.   (Presented Previously) The method according to claim 26, wherein the characteristic discrimination step includes the step of discriminating one of a plurality of attributes to which the image belongs.

28.   (Presented Previously) The method according to claim 27, wherein the attribute is a color attribute of an image.

29.   (Presented Previously) The method according to claim 27, wherein the parameter setting step includes the step of setting the parameter to convert saturation of a color indicated by the attribute in the image into a saturation value which is set in advance in units of attributes.

30.   (Presented Previously) The method according to claim 27, wherein the characteristic discrimination step includes the step of segmenting the image into a plurality of blocks, and discriminating attributes in units of blocks.

31.   (Currently Amended) ~~The~~ An image processing method ~~according to claim 26,~~ comprising:

the characteristic discrimination step of discriminating characteristics of an image;

the saturation calculation step of calculating saturation information of the image;

the parameter setting step of setting a parameter used to convert saturation of the image in accordance with the characteristics discriminated in the characteristic discrimination step;

the saturation conversion step of converting the saturation of the image on the basis of the parameter,

wherein the parameter setting step includes the step of setting parameters in correspondence with low- and high-saturation sides of the image.

32.   (Currently Amended) A recording medium comprising program codes of an image processing method at least comprising:

a code of the characteristic discrimination step of discriminating characteristics of an image;

a code of the saturation calculation step of calculating saturation information of the image;

a code of the parameter setting step of setting a parameter used to convert saturation of the image in accordance with the characteristics discriminated in the characteristic discrimination step; ~~and~~

a code of the saturation conversion step of converting the saturation of the image on the basis of the parameter; and

a code of the holding step of holding saturation information in correspondence with the plurality of attributes,

wherein said parameter setting step includes setting the parameter on the basis of the saturation information held in said holding step.

33.   (New) An image processing method comprising:

a characteristic discrimination step for discriminating characteristics of an image;

a saturation calculation step for calculating saturation information of the image;

a parameter setting step for setting a parameter used to convert saturation of the image in accordance with the characteristics discriminated in said characteristic discrimination step;

a saturation conversion step for converting the saturation of the image on the basis of the parameter;

a detection step for detecting a color distribution of the image;

a generation step for generating gradation correction information of the image on the basis of the color distribution; and

a gradation correction step for performing gradation correction of the image on the basis of the gradation correction information.

34.   (New) A storage medium storing a computer executable program comprising:

code for a characteristic discrimination step for discriminating characteristics of an image;

code for a saturation calculation step for calculating saturation information of the image;

code for a parameter setting step for setting a parameter used to convert saturation of the image in accordance with the characteristics discriminated in said characteristic discrimination step; and

code for a saturation conversion step for converting the saturation of the image on the basis of the parameter,

wherein said parameter setting step includes setting a plurality of parameters in correspondence with low- and high-saturation sides of the image.

35.   (New) A storage medium storing a computer executable program comprising:

code for a characteristic discrimination step for discriminating characteristics of an image;

code for a saturation calculation step for calculating saturation information of the image;

code for a parameter setting step for setting a parameter used to convert saturation of the image in accordance with the characteristics discriminated in said characteristic discrimination step;

code for a saturation conversion step for converting the saturation of the image on the basis of the parameter;

code for a detection step for detecting a color distribution of the image;

code for a generation step for generating gradation correction information of the image on the basis of the color distribution; and

code for a gradation correction step for performing gradation correction of the image on the basis of the gradation correction information.

36.   (New) An image processing apparatus comprising:

a characteristic discrimination unit adapted to discriminate characteristics of an image;

a saturation calculation unit adapted to calculate saturation information of the image;

a parameter setting unit adapted to set a parameter used to convert saturation of the image in accordance with the characteristics discriminated by said characteristic discrimination unit;

a saturation conversion unit adapted to convert the saturation of the image on the basis of the parameter; and

a holding unit adapted to hold saturation information in correspondence with the plurality of attributes,

wherein said parameter setting unit sets the parameter on the basis of the saturation information held in said holding unit.

37.   (New) An image processing apparatus comprising:

a characteristic discrimination unit adapted to discriminate characteristics of an image;

a saturation calculation unit adapted to calculate saturation information of the image;

a parameter setting unit adapted to set a parameter used to convert saturation of the image in accordance with the characteristics discriminated by said characteristic discrimination unit; and

a saturation conversion unit adapted to convert the saturation of the image on the basis of the parameter,

wherein said parameter setting unit sets a plurality of parameters in correspondence with low- and high-saturation sides of the image.

38.   (New) An image processing apparatus comprising:

a characteristic discrimination unit adapted to discriminate characteristics of an image;

a saturation calculation unit adapted to calculate saturation information of the image;

a parameter setting unit adapted to set a parameter used to convert saturation of the image in accordance with the characteristics discriminated by said characteristic discrimination unit;

a saturation conversion unit adapted to convert the saturation of the image on the basis of the parameter;

a detection unit adapted to detect a color distribution of the image;

a generation unit adapted to generate gradation correction information of the image on the basis of the color distribution; and

a gradation correction unit adapted to perform gradation correction of the image on the basis of the gradation correction information.